MULTIMEDIA UNIVERSITY ™

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2022/2023 (TERM ID 2210)

ETN3056 - COMMUNICATIONS NETWORKS

TE

18 FEBRUARY 2023
9:00 AM – 11:00 AM
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 3 pages (including this cover page) with 4 Questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please print all your answers in the Answer Booklet provided.

Question 1

(a) Time Division Multiplexing (TDM) and Wavelength Division Multiplexing (WDM) are the methods of multiplexing multiple signals into single optical carrier. Discuss their differences.

[15 marks]

(b) Explain the origins of the OSI and TCP/IP models, and their key differences. Which one is used in the Internet, and why?

[10 marks]

Question 2

(a) You work for an Internet Service Provider (ISP). To provide Internet access to a new area, your company is considering the following options:
Asymmetric Digital Subscriber Line (ADSL) or *Passive Optical Network (PON)*.
You are tasked to evaluate them. Present in details to your superior the pros and cons of these three technologies, and the circumstances under which they should be chosen.

[15 marks]

(b) With the aid of some figures, describe how cable TV network is capable of providing Internet access service to the users.

[10 marks]

Question 3

(a) Explain **six** important functions of Evolved Packet System (EPS) in the 4G networks.

[12 marks]

(b) With the aid of an illustration, explain the major mobility tasks in the 4G networks.

[13 marks]

Question 4

(a) Explain the concepts of
   (i) 5G New Radio (NR) [2 marks]
   (ii) 5G Core Network (5GC) [2 marks]

(b) With the aid of clear and well-labelled figures, briefly describe the various 5G Non-Standalone (NSA) & Standalone (SA) deployment options.
[12 marks]

(c) (i) Explain three reasons why the cellular network infrastructures are shared by the operators.
[5 marks]
   (ii) Name the two most common methods of sharing the Radio Access Network (RAN). Explain each of them.
[4 marks]

End of Paper